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ELEMENTARY COOKING IN THE LABORATORY SCHOOL.

THE cooking begins in the kindergarten. Foods such as cereals and fruits are selected, since these require the simplest preparation and but little variation in the manipulation of the materials. The children's interest is in the active work which is done, either from direction or demonstration, and in the luncheon which they prepare and serve. The value of the work is in the nice handling and careful use of materials, and in the forming of habits of neatness and order. All this tends to create order not only in doing things of a practical nature, but also in planning. It is similar in nature to the organized play of the kindergarten in the influence it has on the social organization of the group. The observations made during the progress of the work are valuable as emphasizing a few regularly recurring phenomena.

The cooking has particular educational value with the younger children in giving opportunity for individual work, initiative, and independence, and also in calling for group work, which encourages a spirit of helpfulness and nice adjustment of the individual personalities to the work of the group as a whole. It makes an appeal to children which is immediate and direct; and is of such a nature that it can be arranged in orderly sequence; so that, beginning with the simplest preparation of food to be served for luncheon, the children become interested in the materials used and in the processes involved in the preparation of these materials. This makes it possible to introduce simple experiments previous to the cooking, which enable them to work out the formula and the steps used in preparation of the food. The sequence of work forms habits in their nature simple and direct, which can be built upon and further developed in later work where the processes are more involved; and on the social side where the interaction of work among the children requires a finer adjustment to the social life of the group.

The work as given to six-year-old children changes somewhat as regards both the attitude of the children and the manner of presentation in comparison with that given the kindergarten children, the materials being the same, that is, cereals and fruits. Grains are selected on account of their relation to the work in "present occupations," which is begun with the study of a typical grain farm. The interest in the cooking begins with the desire the child has to carry farther the occupation of the farmer and the miller, and to carry the food in its preparation to its final use. These foods also furnish the simplest illustration of the effect of heat and water on the starch and cellulose in preparing them for digestion.

The various preparations of cereals are examined, the methods of preparation considered, and by means of experiments actually made the children compare difference in time required in cooking the different preparations and the reasons for this difference. In cooking each preparation they work out some new point in the application of heat and water. The general idea of the work on cereals has been to begin with the simplest use of fire and water, that is, by putting the starch of the grain into such condition, both by breaking up mechanically the cellulose and by the effect of water on the starch granules, that mastication, taste, and all other processes of digestion are more easily accomplished. Then the idea of grinding the grains to shorten the process of cooking is introduced. Experiments are made to show in a general way the composition of the grain, the difference in the relative amounts of starch and cellulose in the various grains, and the different preparations of grain found in the market, as hulled, cracked, ground, and flaked.

Fruits and vegetables are selected in the year following, because the problems involved in their preparation can be made to originate from the materials used. From experiments suggested by actual work and formulated in class discussion the children are led to a solution of the problems which arise. In the actual preparation of a dish the chief interest is in the luncheon which is the purpose of the lesson in cooking, but the child soon discovers that unless he is sufficiently familiar with materials and processes he is helpless to proceed. The inquiring attitude of children of this age opens up many questions, and also suggestions for their solution.

In the experiments made in this year the interest is in seeing what happens and in making discoveries. The purpose of the experiment is often lost in the interest of the immediate process; therefore the connection made by the teacher between the purpose of the experiment and the problem to be solved, though only a phase of the work, forms a new problem for the childen. For example, the potato is to be cooked. The child is led to compare it with the cereals previously studied. This leads to an analysis of the potato which completely engrosses him for the time being. After he discovers all he can about the potato, he is thrown back to the original problem of how to cook it. This at once calls for an application of the facts discovered in the experiments. The fact that experimentation is continuous throughout the year, and that results are always made use of in some practical end, gives added value to each experiment in that each becomes part of a larger whole, the original problem growing larger and showing many sides.

Increased power of observation is the result, and skill is acquired in handling materials and in controlling processes. The children become acquainted with simple chemical and physical facts in relation to the action of heat and water on the food constituents.

Starch and cellulose were found in cereals studied in the previous year, and are now found in varying conditions in fruits and vegetables. The value of water as a food constituent is considered; also the flavoring principles, such as the essential oils, vegetable acids, sugar, and mineral salts. These are considered, of course, with the younger children more in the part they have in giving character and flavor to the vegetable than in any nutritive value they possess.

When the child begins with these practical activities he also gets an idea of the real value of number; that is in using parts of a cup, and in using these fractional parts as units and then getting the relation of these units to a larger whole, he begins to have an idea of simple fractions. From the manipulation of materials, and comparison of these by weight and measure, he gets in a concrete way a definite idea of proportion which later on can be made use of in abstract number. In connection with the balancing of the grains, to obtain the amount of water required for cooking, recipes are made for the preparations of the grains. He discovers the practical importance of the recipe and just what it is used for, namely, to give the materials and the quantities required.

The vegetables are analyzed in a crude way to discover their relative amounts of starch and water ; also the character of the juice and quality of cellulose. The different modes of cooking which effect the most desirable changes in the typical vegetables are obtained by means of experiment. The child's attitude is one of inquiry, and the material presented in this year offers him possibilities for experimental work.

In connection with the history the children take up primitive modes of cooking out of doors. In this connection are considered primitive methods in the application of heat, such as roasting in hot ashes, on hot metal, stones, stone boiling, and hot stones buried in the ground. The children have two or three primitive feasts where they cook potatoes, corn, apples, chestnuts, and some sort of meat. Application of heat under these new conditions serves as an occasion for the child to abstract the principle he has been using in connection with modern methods and apparatus. This abstraction was a necessary step in the control of the primitive fire-place.

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[*To be continued.*]